

What is claimed is:

1. A data communication device comprising:

a line state monitoring unit for detecting a line state relating to transmission quality in a communication line and producing line state information indicating the line state; and

a transmission control unit, having a plurality of operation modes corresponding to a plurality of error tolerance levels different from each other, for selecting a specific operation mode from the operation modes according to the line state information produced by the line state monitoring unit and performing a transmission control for transmission data, which is planned to be sent out to the communication line, according to the specific operation mode.

2. A data communication device according to claim 1, wherein the specific operation mode is changed to another operation mode by the transmission control unit in response to the change of the line state indicated by the line state information during the transmission of the data without suspending the transmission of the data, and the transmission control is performed for the transmission data according to the changed operation mode by the transmission control unit.

3. A data communication device according to claim 1, wherein the transmission control unit has a plurality of data multiplexing methods corresponding to the operation modes, a specific multiplexing method is selected from the

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6. A data communication device according to claim 1, further comprising:

5 a line interface, connected with the communication line, for sending the transmission data to the communication line,

10 wherein the transmission control unit controls the line interface to add a new communication line connected with the line interface, in cases where the specific operation mode corresponds to a high error tolerance level, and to disconnect the new communication line from the line interface in cases where the specific operation mode is changed to a low error tolerance level.

15 7. A data communication device according to claim 1, further comprising:

20 a line interface for receiving and sending the transmission data to/from the communication line, wherein the transmission control unit controls the line interface to increase a data transfer rate for data sending while decreasing a data transfer rate for data reception by a degree of the increase of the data transfer rate for data sending in cases where the specific operation mode is changed to a particular operation mode corresponding to a high error tolerance level in the transmission control unit to perform the transmission control for the transmission data sent out to the communication line according to the particular operation mode.

30 8. A data communication device according to claim 1,

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a line interface for receiving and sending the transmission data from/to the communication line, wherein the transmission control unit controls the line interface to decrease a data transfer rate for data sending while increasing a data transfer rate for data reception by a degree of the decrease of the data transfer rate for data sending in cases where the specific operation mode is changed to a particular operation mode corresponding to a low error tolerance level in the transmission control unit to perform the transmission control for the transmission data sent out to the communication line according to the particular operation mode.

a line state monitoring unit for detecting a line state relating to transmission quality in a communication line and producing line state information indicating the line state;

a transmission control unit, having a plurality of operation modes corresponding to a plurality of error tolerance levels different from each other, for selecting a specific operation mode from the operation modes according to the line state information produced by the line state monitoring unit and performing a transmission control for transmission data, which is sent out to the communication line or is received through the communication line, according to the specific operation mode; and

an operation mode change request outputting unit for

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[illegible]

where the line state information produced by the line state monitoring unit indicates a deteriorated line state, and the operation mode change request outputting unit requests the second data communication device to change the specific operation mode to an operation mode corresponding to a low error tolerance level in cases where the line state information produced by the line state monitoring unit indicates an ameliorated line state.

13. A data communication device according to claim 9, further comprising:

an operation mode change request receiving unit for receiving an operation mode change request from the second data communication device, and sending the operation mode change request to the transmission control unit to make the transmission control unit perform the transmission control for the transmission data, which is received through the communication line or is sent out to the communication line, according to a particular operation mode indicated by the operation mode change request.

14. A data communication device according to claim 9, further comprising:

a line interface, connected with the communication line, for receiving or sending the transmission data from/to the communication line,

wherein the transmission control unit controls the line interface to add a new communication line connected with the line interface, in cases where the specific operation mode corresponds to a high error tolerance level, and to

5 a low error tolerance level.

further comprising:

30 tolerance level according to the operation mode change

request.

16. A data communication device according to claim 9,
wherein the operation mode change request outputting unit
5 requests the second data communication device to add a new
communication line connected with the second data
communication device in cases where the operation mode
change request outputting unit requests the second data
communication device to change the specific operation mode
10 to an operation mode corresponding to a high error
tolerance level, and the operation mode change request
outputting unit requests the second data communication
device to disconnect the new communication line, which is
connected with the second data communication device, from
15 the second data communication device in cases where the
operation mode change request outputting unit requests the
second data communication device to change the operation
mode corresponding to the high error tolerance level to
an operation mode corresponding to a low error tolerance
20 level.

17. A data communication device according to claim 9,
further comprising:

a line interface for receiving and sending the
25 transmission data from/to the communication line,
wherein the transmission control unit controls the line
interface to increase a data transfer rate for data sending
while decreasing a data transfer rate for data reception
by a degree of the increase of the data transfer rate for
30 data sending, in cases where the specific operation mode

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is changed to a particular operation mode corresponding to a high error tolerance level in the transmission control unit to perform the transmission control for the transmission data sent out to the communication line

5 according to the particular operation mode, and to increase a data transfer rate for data reception while decreasing a data transfer rate for data sending by a degree of the increase of the data transfer rate for data reception in cases where the specific operation mode is changed to a
10 particular operation mode corresponding to a high error tolerance level in the transmission control unit to perform the transmission control for the transmission data received through the communication line according to the particular operation mode.

15 18. A data communication device according to claim 9, further comprising:

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20 a line interface for receiving and sending the transmission data from/to the communication line, wherein the transmission control unit controls the line interface to decrease a data transfer rate for data sending while increasing a data transfer rate for data reception by a degree of the decrease of the data transfer rate for data sending, in cases where the specific operation mode
25 is changed to a particular operation mode corresponding to a low error tolerance level in the transmission control unit to perform the transmission control for the transmission data sent out to the communication line according to the particular operation mode, and to decrease
30 a data transfer rate for data reception while increasing

a data transfer rate for data sending by a degree of the decrease of the data transfer rate for data reception in cases where the specific operation mode is changed to a particular operation mode corresponding to a low error tolerance level in the transmission control unit to perform the transmission control for the transmission data received through the communication line according to the particular operation mode.

19. A data communication device according to claim 13, further comprising:

a line interface for receiving and sending the transmission data from/to the communication line, wherein the operation mode change request receiving unit further receives a data rate change request from the second data communication device, the operation mode change request receiving unit sends the data rate change request to the transmission control unit, the transmission control unit controls the line interface to increase a data transfer rate for data sending while decreasing a data transfer rate for data reception by a degree of the increase of the data transfer rate for data sending according to the data rate change request, in cases where the specific operation mode is changed to a particular operation mode corresponding to a high error tolerance level in the transmission control unit according to the operation mode change request to perform the transmission control for the transmission data sent out to the communication line according to the particular operation mode, and the transmission control unit controls the line interface to

increase a data transfer rate for data reception while decreasing a data transfer rate for data sending by a degree of the increase of the data transfer rate for data reception according to the data rate change request in cases where the specific operation mode is changed to a particular operation mode corresponding to a high error tolerance level in the transmission control unit according to the operation mode change request to perform the transmission control for the transmission data received through the communication line according to the particular operation mode.

20. A data communication device according to claim 9, wherein the operation mode change request outputting unit requests the second data communication device to increase a data transfer rate for data sending while decreasing a data transfer rate for data reception by a degree of the increase of the data transfer rate for data sending, in cases where the operation mode change request outputting unit requests the second data communication device to change the specific operation mode to a particular operation mode corresponding to a high error tolerance level in the transmission control unit according to the operation mode change request to perform the transmission control for the transmission data sent out to the communication line according to the particular operation mode, and the operation mode change request outputting unit requests the second data communication device to increase a data transfer rate for data reception while decreasing a data transfer rate for data sending by a degree of the

increase of the data transfer rate for data reception in cases where the operation mode change request outputting unit requests the second data communication device to change the specific operation mode to a particular

- 5 operation mode corresponding to a high error tolerance level in the transmission control unit according to the operation mode change request to perform the transmission control for the transmission data received through the communication line according to the particular operation
- 10 mode.

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